

WE CLAIM:

1. A method of generating and assembling secretory antibodies within a single cell, said method comprising:

- 5 a. introducing into the genome of a first member of a plant species a first mammalian nucleotide sequence encoding an immunoglobulin alpha heavy chain portion-containing polypeptide including a leader sequence forming a secretion signal, to produce a first transformant;
- 10 b. introducing into the genome of a second member of said plant species a second mammalian nucleotide sequence encoding a polypeptide linker or joining chain, to produce a second transformant;
- c. introducing into the genome of a third member of said plant species a third mammalian nucleotide sequence encoding a secretory component, to produce a third transformant;
- 15 d. sexually crossing said transformants to generate a progeny population containing all three mammalian sequences; and
- e. isolating from said progeny population a transgenic plant species producing a secretory antibody.

20 2. The method of claim 1, wherein said method further comprises introducing into the genome of a fourth member of said plant species a fourth mammalian nucleotide sequence encoding an immunoglobulin light chain portion-containing polypeptide including a leader sequence forming a secretion signal, to produce a fourth transformant; sexually crossing said fourth transformant with said other transformants to generate a progeny population containing all four mammalian sequences; and isolating from said progeny population a transgenic plant species producing a

25 secretory antibody.

3. The method of claim 1, wherein said first mammalian nucleotide sequence encodes a single-chain antibody.

4. The method of claim 1, wherein said first mammalian nucleotide sequence encodes an immunoglobulin alpha heavy chain portion-containing polypeptide including more than one

30 variable region.

5. The method of claim 1, wherein nucleotide sequences are introduced via separate vectors.

6. A transgenic plant comprising:

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- a. plant cells that contain a nucleotide sequence encoding one or more immunoglobulin heavy-chain polypeptides, a nucleotide sequence encoding a polypeptide linker or joining chain, and a nucleotide sequence encoding a secretory component; and
- b. immunologically active secretory antibodies encoded by said nucleotide sequences.
- 5 7. The plant of claim 6, further comprising a nucleotide sequence encoding one or more light-chain polypeptides.
8. The plant of claim 6, wherein all three nucleotide sequences are contained within a single cell.
9. The plant of claim 7, wherein all four nucleotide sequences are contained within a
- 10 single cell.
10. The plant of claim 6, which is a dicotyledonous plant.
11. The plant of claim 6, which is a monocotyledonous plant.
12. The plant of claim 6, wherein each of said nucleotide sequences is included on a separate vector.
- 15 13. A method of passively immunizing a human or animal subject against a preselected ligand, comprising administering to said subject a prophylactic amount of a biologically active immunoglobulin molecule capable of binding a preselected ligand, wherein said molecule is free from detectable sialic acid residues.
14. The method of claim 13, wherein said immunoglobulin molecule is encapsulated in
- 20 a plant cell.
15. The method of claim 13, wherein said immunoglobulin molecule is administered as part of a composition, which composition further comprises a material having nutritional value.
16. The method of claim 15, wherein said material having nutritional value is derived from a plant or an animal.
- 25 17. The method of claim 13, wherein said immunoglobulin molecule is administered as part of a composition, which composition further comprises a physiologically inert material.
18. The method of claim 13, wherein said immunoglobulin is an antibody or an immunologically active derivative or fragment thereof.
19. The method of claim 13, wherein said immunoglobulin is secretory IgA or an
- 30 immunologically active derivative or fragment thereof.
20. The method of claim 13, wherein said preselected ligand is a pathogen antigen.